

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A developing apparatus comprising:

a substrate holding unit ~~for holding~~ configured to hold a substrate in a substantially horizontal attitude, ~~the substrate having an exposed resist thereon;~~

a developer supply nozzle ~~for delivering~~ configured to deliver a developing solution to the substrate, the developer supply nozzle having therein an ejection port that has a length substantially equal to or larger than a width of an effective area of the substrate;

a diluent supply nozzle ~~for delivering~~ configured to deliver a diluent to the substrate, the diluent supply nozzle having therein an ejection port that has a length substantially equal to or larger than the width of the effective area of the substrate;

a temperature regulating unit ~~for controlling~~ configured to control temperature of the developing solution to be supplied from the developer supply nozzle, the temperature regulating unit including a first temperature regulating device and a second temperature regulating device according to a type of the resist on the substrate or a specific geometrical characteristic of a pattern of the resist;

a drive mechanism ~~for moving~~ configured to move the developer supply nozzle and the diluent supply nozzle from one end of the substrate to the opposite end of the substrate; and

a control unit ~~for controlling~~ configured to control operation of the developer supply nozzle, the diluent supply nozzle, the temperature regulating unit and the device mechanism, ~~such that the diluent is supplied to a surface of the substrate when the developing solution is deteriorated due to progression of developing reaction after supplying of the developing solution so that a developing reaction rate is lowered~~

wherein the developer supply nozzle includes:

a developer buffer portion having a developer buffer chamber provided in the developer supply nozzle to temporarily store the developing solution;

said first temperature regulating device provided to regulate temperature of the developer in the developer buffer chamber;

the ejection port provided below the developer buffer chamber;

a communication passage allowing the developer stored in the developer buffer chamber to be fed into the ejection port;

a damper rod provided within the ejection port at location such that the developer fed into the ejection port via the communication passage collides with the damper rod; and

said second temperature regulating device is disposed in the damper rod.

Claim 2 (Original): The developing apparatus according to claim 1, wherein said apparatus includes plural number of said developer supply nozzles, and each of the developer supply nozzles is provided with a temperature regulating unit to control the temperature of a developing solution.

Claim 3 (Original): The developing apparatus according to claim 2, wherein the developer supply nozzles are integrated together into a single liquid-supplying nozzle unit moved by a common drive mechanism.

Claim 4 (Previously Presented): The developing apparatus according to claim 1, wherein the developer supply nozzle and the diluent supply nozzle are integrated together into a single liquid-supplying nozzle unit moved by a common drive mechanism.

Claim 5 (Previously Presented): The developing apparatus according to claim 3, wherein the liquid-supplying nozzle unit is adapted to eject a plurality of developing solutions or diluents through a common ejection port.

Claim 6 (Previously Presented): The developing apparatus according to claim 3, wherein:

the liquid-supplying nozzle unit has a developer ejection port for ejecting a developing solution and a diluent ejection port for ejecting a diluent; and

the developer ejection port and the diluent ejection port are arranged adjacent each other in a direction of movement of the liquid-supplying nozzle unit.

Claim 7 (Original): The developing apparatus according to claim 6, wherein:

the developer ejection port is located on a forward side of the liquid-supplying nozzle unit with respect to the direction of movement of the liquid-supplying nozzle unit; and

a suction port is provided between the developer ejection port and the diluent ejection port to suck a developing solution on the surface of the substrate.

Claims 8-10 (Canceled).

Claim 11 (Previously Presented): The developing apparatus according to claim 3, wherein a temperature regulating unit is arranged in a developer supply nozzle to control the temperature of a developing solution.

Claim 12 (Previously Presented): The developing apparatus according to claim 3, wherein a temperature regulating unit is arranged in the liquid-supplying nozzle.

Claims 13-16 (Canceled).

Claim 17 (Withdrawn): A developing method comprising the steps of:

applying a developing solution to a surface of an exposed resist film on a substrate by using a nozzle;

adjusting the temperature of the developing solution such that the resist in a region to be removed by developing is dissolved as much as needed, before the developing solution is applied;

leaving the substrate coated with the developing solution for a predetermined period of time to promote development reaction, thereby dissolving regions of the resist to be removed by the development reaction;

supplying, after the step of leaving the substrate, a diluent for reducing a concentration of the developing solution thereby for suppressing or stopping dissolving of the resist, to the substrate; and

supplying, after the step of supplying the diluent, a cleaning liquid to the substrate for cleaning;

wherein the developing solution supplying step supplies the diluent when the developing solution is deteriorated due to progression of developing reaction after supplying of the developing solution so that a developing reaction rate is lowered.

Claim 18 (Withdrawn): The developing method according to claim 17, wherein each of the step of applying the developing solution and the step of supplying the diluent includes a step of moving a nozzle from one end of the substrate to the opposite end the substrate, the

nozzle having therein an ejection port that has a length substantially equal to or larger than a width of an effective area of the substrate.

Claim 19 (Withdrawn): The developing method according to claim 18, wherein a nozzle movement direction and a nozzle movement speed at the step of supplying the diluent are the same as those at the step of applying the developing solution.

Claim 20 (Withdrawn): The developing method according to claim 17, wherein the step of applying the developing solution and the step of supplying the diluent use the same nozzle to deliver the developing solution and the diluent, respectively, to the surface of the substrate.

Claim 21 (Withdrawn): The developing method according to claim 17, wherein:  
the developing method is performed by using a developing apparatus including a plurality of developer nozzles; and

said developing method further comprising the step of:

while a developing solution is being applied by using one of the plurality of developer nozzles, adjusting the temperature of a developing solution for another one of the plurality of developer nozzles.

Claim 22 (Withdrawn): The developing method according to claim 21, wherein the plurality of developer nozzles are integrated together into a single liquid-supplying nozzle unit.

Claim 23 (Withdrawn): The developing method according to claim 17, further comprising the step of:

adjusting temperature and concentration of a developing solution before the developing solution is applied to the substrate.

Claim 24 (Withdrawn): The developing method according to claim 23, wherein:  
the developing method is performed by using a developing apparatus including a plurality of developer nozzles; and

said developing method further comprising the step of:

while a developing solution is being applied by using one of the plurality of developer nozzles, adjusting temperature and concentration of a developing solution for another one of the plurality developer nozzles.

Claim 25 (Withdrawn): The developing method according to claim 17, wherein, at any portion of an effective area of the substrate, a diluent is supplied 20 seconds or less after a developing solution is supplied.

Claim 26 (Currently Amended): The developing apparatus according to claim [[1]] 35, wherein ~~the control unit is configured to control the operation of the diluent supply nozzle~~  
said means for controlling initiation timing is configured to determine the initiation timing  
such that the [[a]] diluent is supplied 20 seconds or less after a developing solution is supplied to the surface of the substrate from the developer supply nozzle.

Claim 27 (Currently Amended): The developing apparatus according to claim [[1]] 35, wherein ~~the temperature regulating unit adjusts~~ said means for controlling temperature is

configured to adjust the temperature of the developing solution at a temperature in a range of 40°C to 60°C if solubility of the resist to the developing solution is low.

Claim 28 (Currently Amended): The developing apparatus according to claim [[1]] 35, wherein ~~the temperature regulating unit adjusts~~ said means for controlling temperature is configured to adjust the temperature of the developing solution at a temperature in a range of 20°C to 40°C if solubility of the resist to the developing solution is high.

Claim 29 (Currently Amended): The developing apparatus according to claim [[1]] 35, wherein ~~the temperature regulating unit adjusts~~ said means for controlling temperature adjust the temperature of the developing solution at a temperature in a range of 10°C to 40°C if dissolving of the resist is promoted at a low temperature.

Claim 30 (Canceled).

Claim 31 (Previously Presented): The developing apparatus according to claim 4, wherein the liquid-supplying nozzle unit is provided therein with a developer buffer portion for storing a developing solution therein and a diluent buffer portion for storing a diluent therein, and a temperature adjusting device utilizing Peltier effect is arranged between the developer buffer portion and the diluent buffer portion.

Claim 32 (New): The developing apparatus according to claim 1, wherein the second temperature regulating device comprises one selected from the group consisting of:

a temperature regulating medium passage formed in the damper rod to allow a temperature regulating medium to flow therethrough;

a heater embedded in the damper rod; and  
a heat pipe embedded in the damper rod.

Claim 33 (New): A developing apparatus comprising:

a substrate holding unit configured to hold a substrate in a substantially horizontal attitude;

a process liquid supply nozzle provided to deliver a process liquid, which is necessary for performing a developing process, to the substrate held by the substrate holding unit, the process liquid supply nozzle including:

a buffer chamber provided in the process liquid supply nozzle;

a first temperature regulating device provided to regulate temperature of the process liquid in the buffer chamber;

an elongated ejection port provided below the buffer chamber;

a communication passage allowing the process liquid stored in the buffer chamber to be fed into the ejection port;

a damper rod extending within the elongated ejection port at such a location that the process liquid fed into the ejection port via the communication passage collide with the damper rod; and

a second temperature regulating device provided in the damper rod.

Claim 34 (New): The developing apparatus according to claim 33, wherein the second temperature regulating device comprises one selected from the group consisting of:

a temperature regulating medium passage formed in the damper rod to allow a temperature regulating medium to flow therethrough;

a heater embedded in the damper rod; and



a heat pipe provided in the damper rod.

Claim 35 (New): A developing apparatus comprising:

a substrate holding unit configured to hold a substrate in a substantially horizontal attitude, the substrate having an exposed resist thereon;

a developer supply nozzle configured to deliver a developing solution to the substrate, the developer supply nozzle having therein an ejection port that has a length substantially equal to or larger than a width of an effective area of the substrate;

a diluent supply nozzle configured to deliver a diluent to the substrate, the diluent supply nozzle having therein an ejection port that has a length substantially equal to or larger than the width of the effective area of the substrate;

a drive mechanism configured to move the developer supply nozzle and the diluent supply nozzle from one end of the substrate to the opposite end of the substrate; and

means for controlling temperature of the developing solution according to a type of the resist on the substrate or a specific geometrical characteristic of a pattern of the resist; and

means for controlling initiation timing of delivering of the diluent from the diluent supply nozzle to the substrate held by the substrate holder such that the delivering of the diluent initiates when the developing solution is deteriorated due to progression of developing reaction of the developing solution delivered to the substrate so that a developing reaction rate is lowered.